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Chemical company earnings generally drop during second quarter Page 22

NEWS

Destruction of Chemical Weapons

There is the will, but is there a way?
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CHEMICAL & ENGINEERING
NEWS
AUGUST 13, 1990

Volume 68, Number 33
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News of the Week

■ **Iraqi invasion of Kuwait may spur chemical recession.** **Page 4**

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Business

Falling prices and slim demand lead to continued downward trend in earnings for U.S. chemical companies as they report second-quarter results. **Page 22**

Government

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Science/Technology

AUTONOM, new computer software developed at West Germany's Beilstein Institute, uses IUPAC rules to provide names for graphic chemical structures. **Page 31**

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Cover: U.S. chemical weapons disposal facility at Johnston Atoll in Pacific Ocean. Photo courtesy of the Army

News Focus

U.S./Soviet agreement to dispose of the bulk of their chemical weapons by the year 2002 faces hurdles of unperfected technology, environmental concerns, and unrealistic schedules. **Page 9**

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Chemical & Engineering News
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LETTERS

CHEMICAL SAFETY

Piranha solution explosions

A letter by Daniel Dobbs, Robert Bergman, and Klaus Theopold (C&EN, April 23, page 2) describes two explosions associated with "piranha solution" (30% H_2O_2 and concentrated H_2SO_4 mixed in equal volumes). These incidents call for further comment.

One of the incidents involved the use of an H_2O_2/H_2SO_4 mixture and acetone in a cleaning procedure. It should be pointed out that even in the absence of sulfuric acid, mixtures of acetone and hydrogen peroxide can give rise to the formation of a shock-sensitive organic peroxide. A number of explosions have occurred in this way. As the world's largest manufacturer of peroxygen chemicals, Interox strongly advises taking every precaution to prevent even inadvertent mixing of hydrogen peroxide and acetone. In this case, the presence of sulfuric acid would have tended to increase the hazard; sulfuric acid can (in effect) activate hydrogen peroxide toward reaction with most organic compounds. The described cleaning procedure is clearly hazardous and should not be used.

In the second incident, a bottle of H_2O_2/H_2SO_4 mixture exploded after standing for a week. The authors of the letter state that the bottle was, to their knowledge, loosely capped. They further state that "the force of the detonation makes it seem likely to us that it was due to a chemical reaction rather than simply to the buildup of pressure in the container." Although it is impossible to be sure without more detailed information, the damage described (destroyed bottles) does not seem inconsistent with what might be expected if an H_2O_2 / H_2SO_4 solution was inadvertently sealed. Even moderate confinement can lead to a surprisingly powerful pressure burst. We know of incidents in which stoppered glass volumetric flasks containing 1% H_2O_2 were shattered by the slow evolution of oxygen. We recommend the use of vented caps on all bottles containing peroxygen solutions.

Piranha solution is a powerful oxidant and should never be used casually or without a detailed understanding of the possible hazards. However, these incidents should be interpreted in light of the fact that H_2O_2/H_2SO_4 mixtures are widely (and safely) used in industry—particularly in semiconductor chip manufacturing.

C. Vance Erickson
Interox America
Deer Park, Tex.

Community of scholars

John P. Sevanair's pessimistic assessment of the recruitment value of undergraduate research (C&EN, April 23, page 74) compels me to respond, although I expect he will dismiss this as simply another personal anecdote. (I wonder how many such anecdotes are needed to constitute good evidence?)

I was a sophomore math major at the University of Notre Dame when I was attracted to undergraduate research in inorganic chemistry. The great time some of my peers were having as part of Bob Scheidt's "undergraduate army" convinced me I should find out what I was missing. It turned out to be hard work, long hours, close friendships, intellectual fulfillment, and lots of fun. I became a chem major, and later a physical chemist. I now teach, do research, and direct the research of graduate and undergraduate students.

The subculture to which I was exposed while working in the lab, attending research seminars, and hanging around the chem building at all hours of the day and night appealed to me strongly. It was this undergraduate experience that led me to pursue chemistry, and no amount of good teaching in the classroom could have done it, nor could bad teaching have dissuaded me.

I do not mean to deny the importance of good teaching. The current reaffirmation of its value, even at large research institutions, has been, in my opinion,

Continued on page 47

Correction

* July 16, page 35: Solomon H. Snyder has published more than a 1000 scientific articles since getting his M.D. in 1962, rather than 100.

Chemical Earnings Continue Downward Trend in Second Quarter

William J. Storck,
C&EN Northeast News Bureau

U.S. chemical earnings continued their downward trend in the second quarter as falling prices and lackluster demand hit profitability.

C&EN's quarterly survey of chemical earnings shows a double-digit decline at chemical and oil companies, but improvement at diversified firms that produce chemicals and at drug manufacturers for the quarter.

At 30 chemical companies regularly surveyed by C&EN, total earnings declined for the fourth straight quarter. These firms had total earnings for the quarter of $1.62 billion, down 24% from the same period in 1989. At the same time, sales rose 3% to $21.8 billion for the 30 chemical firms. As a result, profit margins fell to an average 7.4% from 10.0%.

A disquieting fact is that in the second quarter, which historically shows good growth from the first, earnings for the 30 companies improved only 3% from the January through March period of this year. However, sales grew almost 8% on a quarter-to-quarter basis.

For the first six months, combined earnings at the 30 companies fell 25% to $3.20 billion on sales growth of 3% to $43.3 billion. Profit margins fell to an aggregate 7.4% from 10.1% in the first half of 1989.

As in past quarters, demand in major markets caused problems. Again, autos and housing continued their relatively poor performance, leading to, at best, flat demand for chemicals in these sectors.

More than half of the decline in chemical earnings in the quarter, came at Dow Chemical, where earnings fell 50% from year-earlier levels to $364 million. Without Dow, the

Chemical industry leaders for the second quarter . . .

Sales				Earnings[a]			Profitability		
Rank 1990		$ Millions	Rank 1989		$ Millions	Rank 1989		Earnings as % of sales	Rank 1989
1	Dow Chemical	$4807.0	1	Dow Chemical	$364.0	1	International Flavors	18.1%	1
2	Monsanto	2367.0	2	Monsanto	247.0	2	Arco Chemical	14.5	4
3	Union Carbide	2135.0	3	Union Carbide	116.0	3	Georgia Gulf	14.1	3
4	W. R. Grace	1628.5	4	American Cyanamid	108.4	5	Great Lakes Chemical	13.5	5
5	American Cyanamid	1228.3	5	Arco Chemical	102.0	4	Loctite	12.6	7
6	Hercules	795.8	6	Rohm & Haas	70.0	6	Vista Chemical	11.2	2
7	Rohm & Haas	768.5	7	Ethyl	57.1	9	Betz Laboratories	11.1	10
8	Air Products	712.8	10	Air Products	56.8	7	Nalco Chemical	11.0	9
9	Arco Chemical	705.0	8	W. R. Grace	51.3	12	Monsanto	10.4	11
10	Olin	660.0	11	International Flavors	45.9	14	Ethyl	9.5	13

. . . and for the first six months of 1990

Sales				Earnings[a]			Profitability		
Rank 1990		$ Millions	Rank 1989		$ Millions	Rank 1989		Earnings as % of sales	Rank 1989
1	Dow Chemical	$9707.0	1	Dow Chemical	$826.0	1	International Flavors	17.7%	2
2	Monsanto	4653.0	2	Monsanto	441.0	2	Arco Chemical	16.3	5
3	Union Carbide	4308.0	3	Arco Chemical	227.0	4	Georgia Gulf	14.5	2
4	W. R. Grace	3135.8	4	Union Carbide	210.0	3	Great Lakes Chemical	13.5	1
5	American Cyanamid	2380.8	5	American Cyanamid	205.3	5	Loctite	12.2	7
6	Hercules	1567.2	6	Rohm & Haas	124.1	6	Betz Laboratories	10.9	8
7	Rohm & Haas	1462.9	9	Air Products	111.1	8	Nalco Chemical	10.7	9
8	Air Products	1425.9	10	Ethyl	109.6	11	Vista Chemical	10.0	4
9	Arco Chemical	1390.0	8	International Flavors	87.5	13	Monsanto	9.5	10
10	Olin	1296.0	11	W. R. Grace	83.9	14	Ethyl	9.1	12

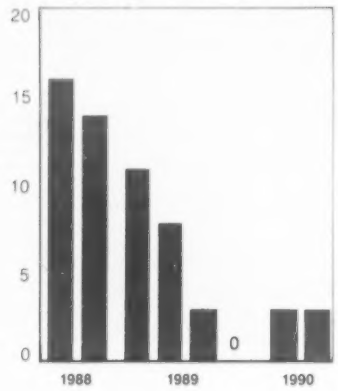
Note: Based on 30 chemical companies listed on page 24. a. After taxes.

Chemical industry second-quarter 1990 results

- Sales were up 3%
- Earnings dropped 24%
- Profit margins were 7.4%
- Production increased 1.7%
- Prices declined 1.8%

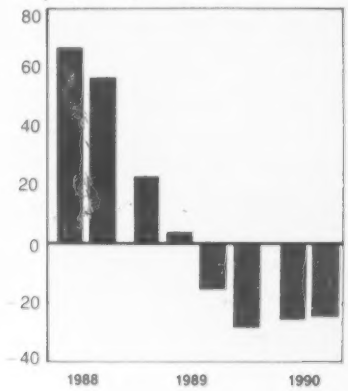
Sales

% change from year-earlier quarter



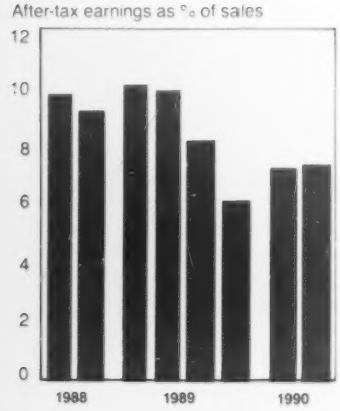
Earnings

% change from year-earlier quarter



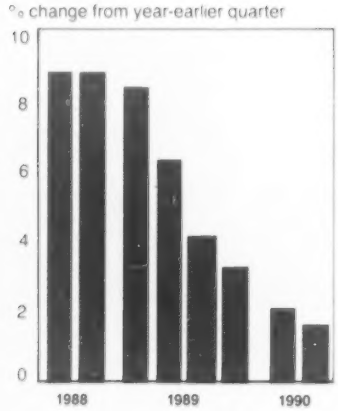
Profit margins

After-tax earnings as % of sales



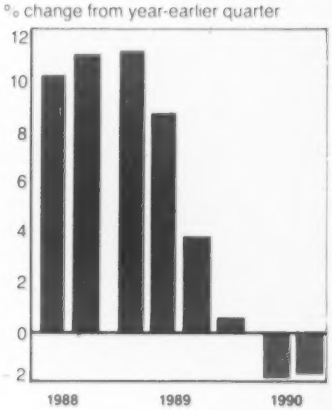
Production

% change from year-earlier quarter



Prices

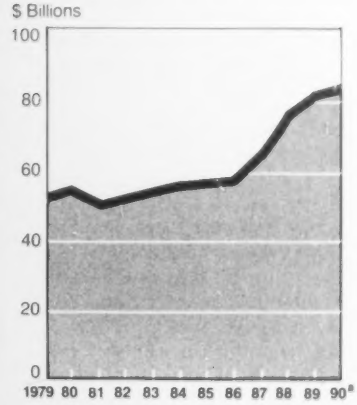
% change from year-earlier quarter



Sales in 1990 likely to rise about 2% as earnings drop 15%, lowering profit margins to about 7.2%

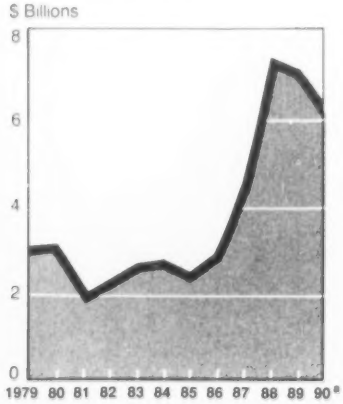
Annual sales

$ Billions



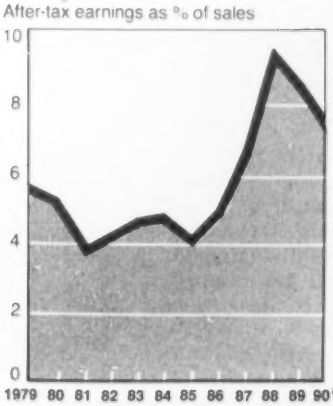
Annual earnings

$ Billions



Annual profit margins

After-tax earnings as % of sales



Note: All sales, earnings, and profit margin data are based on 30 chemical companies listed on page 24. ■ C&EN estimates

Earnings and profitability dropped for chemical companies in the second quarter

	SECOND-QUARTER 1990						FIRST-HALF 1990			
	Sales	Earnings[a]	Change from 1989		Profit margin[b]		Sales	Earnings[a]	Change from 1989	
	($ millions)		Sales	Earnings	1990	1989	($ millions)		Sales	Earnings
Air Products	$ 712.8	$ 56.8	7%	7%	8.0%	8.0%	$ 1,425.9	$ 111.1	7%	6%
American Cyanamid	1,228.3	108.4	6	11	8.8	8.5	2,380.8	205.3	5	17
Arco Chemical	705.0	102.0	−3	−15	14.5	16.5	1,390.0	227.0	−2	−4
Betz Laboratories	147.6	16.4	13	17	11.1	10.8	290.9	31.8	14	17
Cabot	421.0	16.3	−11	70	3.9	2.0	876.1	31.3	−13	−15
Chemed	151.4	5.4	0	−26	3.5	4.8	265.3	9.6	−9	−24
Crompton & Knowles	98.4	5.3	3	17	5.4	4.7	192.7	9.4	5	20
Dow Chemical	4,807.0	364.0	4	−50	7.6	15.8	9,707.0	826.0	7	−44
Ethyl	603.3	57.1	0	12	9.5	8.5	1,210.0	109.6	3	7
First Mississippi	146.6	0.8	7	def	0.5	def	263.5	2.1	3	−65
H. B. Fuller	204.7	6.3	4	28	3.1	2.5	386.2	7.9	3	16
Georgia Gulf	218.7	30.9	−25	−37	14.1	16.9	470.4	68.3	−23	−35
B. F. Goodrich	632.5	34.9	1	−34	5.5	8.4	1,222.3	51.1	−2	−51
W. R. Grace	1,628.5	51.3	8	15	3.1	3.0	3,135.8	83.9	8	12
Great Lakes Chemical	256.5	34.5	33	11	13.5	16.2	508.8	68.8	51	15
Hercules	795.8	30.2	1	−27	3.8	5.3	1,567.2	63.9	2	−26
Imcera Group	402.8	27.8	51	−35	6.9	16.0	774.5	46.5	48	−30
International Flavors	253.9	45.9	7	11	18.1	17.5	495.3	87.5	7	9
Loctite	139.2	17.6	15	9	12.6	13.3	273.1	33.4	15	10
Lubrizol	357.8	33.1	9	27	9.2	7.9	715.0	62.2	6	10
Monsanto	2,367.0	247.0	1	2	10.4	10.3	4,653.0	441.0	1	−5
Morton International	429.1	30.5	28	31	7.1	6.9	876.2	69.6	19	20
Nalco Chemical	301.6	33.1	13	12	11.0	11.1	586.4	62.8	13	15
Olin	660.0	29.0	0	−17	4.4	5.3	1,296.0	61.0	−2	−12
Petrolite	72.6	3.6	1	10	5.0	4.6	144.6	7.3	0	14
Quantum Chemical	586.0	7.1	−13	−85	1.2	6.8	1,268.8	12.9	−15	−89
Rohm & Haas	768.5	70.0	5	1	9.1	9.4	1,462.9	124.1	3	1
Union Carbide	2,135.0	116.0	−6	−38	5.4	8.2	4,308.0	210.0	−5	−46
Vista Chemical	182.9	20.4	−10	−42	11.2	17.3	366.7	36.6	−9	−46
Witco	403.3	18.5	−2	−20	4.6	5.6	798.6	33.0	−2	−18
TOTAL[c]	$21,817.7	$1620.2	3%	−24%	7.4%	10.0%	$43,312.0	$3195.1	3%	−25%

a After-tax earnings from continuing operations, excluding significant nonrecurring and extraordinary items. b After-tax earnings as a percentage of sales. c For 30 companies reporting.

remaining 29 firms would have shown an average decline of 10%.

Dow attributed its large decline to many things, including lower prices and higher costs. The company says anticipated price increases did not materialize and overall pricing levels slipped from the first quarter and from the year-earlier quarter. Also, the company says manufacturing costs were up 3% in spite of declining feedstock and energy costs, resulting from extended plant maintenance shutdowns and production outages in several major facilities.

In another case of things not always being what they seem, of the 30 companies, only 12 had earnings declines, although all of these were in double digits. This certainly does not indicate a full-blown chemical recession, but it is worrisome in that, unless the fundamentals change, the downward trend could spread further through the industry as it did in the early 1980s.

The remaining firms for the most part showed moderate sales growth for the quarter. And, in spite of the decline in both earnings and profit margins, profitability remains relatively high. On a historical basis, the industry was at about 7.5% in the first quarter of 1980 and did not reach that level again until about the first quarter of 1987. And it is only since 1988 that the chemical industry started seeing the high profit margins that it seems to have become accustomed to.

Within the chemical industry, the economics are fairly flat. Production of chemicals and products, according to government data, rose only 1.7% from the same quarter a year ago, but was essentially flat when compared with the first quarter.

Prices for chemicals and allied

FIRST-HALF 1990		12-MONTH RUNNING DATA			
Profit margin[b]		Change from 1989		Profit margin[b]	
1990	1989	Sales	Earnings	1990	1989
7.8%	7.9%	6%	−5%	7.7%	8.5%
8.6	7.8	1	−7	6.3	6.9
16.3	16.6	−8	−20	15.1	17.3
10.9	10.7	14	15	10.9	10.8
3.6	3.6	−9	−32	2.6	3.5
3.6	4.3	1	1	3.9	3.9
4.9	4.3	2	16	6.6	5.8
8.5	16.2	4	−33	10.1	15.6
9.1	8.7	6	−3	9.2	10.1
0.8	2.3	15	−73	0.9	3.8
2.0	1.8	5	−4	2.2	2.4
14.5	17.2	−18	−27	16.1	18.1
4.2	8.4	−5	−48	4.9	9.0
2.7	2.6	7	18	3.4	3.0
13.5	17.7	56	16	13.7	18.5
4.1	5.6	8	−50	2.2	4.6
6.8	12.7	44	−19	4.5	8.0
17.7	17.2	7	9	16.2	15.8
12.2	12.7	12	13	12.0	11.9
8.7	8.4	6	−3	7.8	8.5
9.5	10.0	2	0	7.1	7.3
7.9	7.9	17	6	7.9	8.7
10.7	10.6	11	17	11.2	10.7
4.7	5.2	−1	6	4.7	4.4
5.0	4.4	1	41	4.8	3.4
1.0	7.9	−21	−85	2.1	10.8
8.5	8.7	3	−17	6.6	8.2
4.9	8.6	−3	−45	5.3	9.3
10.0	16.9	−8	−43	10.3	16.7
4.1	5.0	−2	−16	4.3	5.1
7.4%	**10.1%**	**2%**	**−25%**	**7.2%**	**9.8%**

def = deficit.

products for the second quarter declined an average of 1.8% from the second quarter of 1989, but they increased a slight 0.4% from the first quarter. Prices for the large-volume industrial chemicals fell 5.3% compared with the year-earlier quarter and were off about 1.2% against the first quarter of this year.

It is, of course, these large-volume commodity industrial chemicals that weigh so heavily on the chemical industry's fortunes. And they are the most vulnerable to economic cycles. For instance, executives within the chemical industry and especially at very small companies say their plants may still be sold out, but these are mainly in very small volume niche products. The big chemical plants, producing large-volume organic and inorganic chemicals, are having problems. And these problems may be on the rise, stimulated by a number of factors.

Chemical operations at oil companies provide an insight into problems in the petrochemical industry. For eight oil companies—Amoco, Chevron, Exxon, Mobil, Occidental, Shell, Texaco, and Unocal—earnings from chemical operations declined 47% in the second quarter to a total of $1.30 billion. And the declines at the individual companies were not modest—ranging from 24% at Unocal to 66% at Texaco. Almost all of the oil companies point to lower prices, especially for olefins and aromatics, and higher feedstock costs.

The same dominance of commodity chemicals can be seen at narrowly drawn chemical companies such as Quantum, where earnings were down 85%; Vista, down 42%; and Georgia Gulf, off 37%. All three of these companies rely heavily on one type of product. At Vista it is polyvinyl chloride; Georgia Gulf, chlor-alkalis; and Quantum, polyolefins.

Capacity utilization in the chemical industry has been trending downward over the past few months, held up in part, it seems, by exports. According to government data, capacity utilization for chemicals and products was a preliminary 81.8% in June, down from 82.6% in January, but this includes noncyclical products such as pharmaceuticals. Absent these categories, the use rate is probably falling faster.

For instance, Dow says its capacity use rate was 89% in the second quarter, and, while still high, was down from 92% in the first three-month period this year.

The industry has been trying to export to maintain capacity use levels, and this may be working in terms of volume. But export prices of chemicals have been falling, often resulting in lowered profitability from those products sent overseas. In the first five months of this year, the value of exports of chemicals and allied products was up about 5% from the levels of the same period in 1989. But some of the large-volume categories are down from the levels of a year ago. For instance, fertilizer exports fell almost 3% in the latest five-month period when compared with January through May a year earlier, and exports of inorganic and organic chemicals dropped more than 10%. Of the large-volume categories, only plastics improved, according to government data, but rose less than 1% for the January through May period. Du Pont says U.S. volume decreased 5%, while volume in other regions increased 6% from the year-ago quarter. And, it says, the increase in volume outside the U.S. came almost entirely in Europe.

For the remainder of the year, companies remain fairly optimistic in the projections that accompanied their earnings announcements. At Union Carbide, chairman Robert D. Kennedy said he is pleased with results at this point in the business cycle. According to Kennedy, the results reflect the strong focus of the company in its leading businesses. And he said he is encouraged by still strong chemical volumes and particularly pleased by the strong performance of the company's industrial gas business.

Richard J. Mahoney, Monsanto's chairman, said, "While Monsanto's overall second-quarter financial performance wasn't as strong as we hoped earlier in the year, our businesses remain fundamentally very solid and on track when measured against Monsanto's short- and long-term financial objectives."

Enrique C. Falla, Dow's financial vice president, says, "Even with the weakening economic and industry

Earnings fell at oil companies, but were up at diversified and pharmaceutical manufacturers

	SECOND-QUARTER 1990						FIRST-HALF 1990					
	Sales	Earnings[a]	Change from 1989		Profit margin[b]		Sales	Earnings[a]	Change from 1989		Profit margin[b]	
	($ millions)		Sales	Earnings	1990	1989	($ millions)		Sales	Earnings	1990	1989
OIL AND GAS COMPANIES												
American Petrofina	$ 832.6	$ 53.8	−2%	29%	6.5%	4.9%	$ 1,728.9	$ 80.0	10%	18%	4.6%	4.3%
Amoco	7,450.0	379.0	9	−24	5.1	7.3	14,521.0	845.0	9	−12	5.8	7.2
Chevron	8,900.00	590.0	9	15	6.6	6.3	18,300.00	1057.0	15	45	5.8	4.6
Exxon	26,088.0	1100.0	10	11	4.2	4.2	52,801.0	2,380.0	15	4	4.5	5.0
Kerr-McGee	845.8	30.1	3	−13	3.6	4.2	1,657.6	57.2	8	−17	3.5	4.5
Mobil	13,820.0	428.0	−2	−21	3.1	3.9	28,853.0	856.0	3	−12	3.0	3.5
Occidental Petroleum	5,122.0	69.0	1	−18	1.3	1.7	10,281.0	179.0	1	12	1.7	1.6
Phillips Petroleum	2,859.0	105.0	−12	−47	3.7	6.0	5,975.0	364.0	−5	−6	6.1	6.1
Shell Oil	5,174.0	161.0	−12	−63	3.1	7.5	10,928.0	363.0	−1	−55	3.3	7.3
Sun Co.	2,890.0	115.0	−1	64	4.0	2.4	6,000.0	186.0	8	23	3.1	2.7
Texaco	8,721.0	353.0	3	−4	4.0	4.3	17,877.0	681.0	−1	8	3.8	3.5
Unocal	2,716.0	33.0	−11	−65	1.2	3.1	5,359.0	110.0	−6	−40	2.1	3.2
TOTAL	**$85,418.4**	**$3416.9**	**3%**	**−12%**	**4.0%**	**4.7%**	**$174,281.5**	**$ 7158.2**	**7%**	**−3%**	**4.1%**	**4.5%**
DIVERSIFIED MANUFACTURERS												
Allied-Signal	$ 3,184.0	$ 121.0	2%	−15%	3.8%	4.6%	$ 6,239.0	$ 250.0	3%	−7%	4.0%	4.4%
Du Pont	9,646.0	694.0	4	−3	7.2	7.7	19,050.0	1,309.0	6	−10	6.9	8.1
Eastman Kodak	4,872.0	384.0	2	26	7.9	6.4	8,983.0	583.0	0	13	6.5	5.7
Engelhard	751.3	18.2	25	20	2.4	2.5	1,409.8	39.9	18	35	2.8	2.5
FMC	987.2	54.8	8	−1	5.6	6.1	1,800.7	92.8	3	4	5.2	5.1
Ferro Corp.	282.1	7.1	2	−46	2.5	4.8	561.8	13.1	3	−49	2.3	4.7
3M	3,234.0	342.0	7	5	10.6	10.8	6,398.0	677.0	6	5	10.6	10.7
NL Industries	230.6	40.8	−14	−1	17.7	15.3	400.8	65.5	0	−22	16.3	20.9
PPG Industries	1,571.6	166.0	5	30	10.6	8.5	3,049.9	291.3	3	13	9.6	8.7
Tenneco	3,636.0	206.0	−1	14	5.7	4.9	7,238.0	340.0	4	18	4.7	4.1
Vulcan Materials	295.7	39.7	1	−9	13.4	14.8	527.7	58.3	3	−2	11.1	11.6
TOTAL	**$28,690.4**	**$2073.6**	**4%**	**6%**	**7.2%**	**7.1%**	**$ 55,658.7**	**$ 3720.0**	**4%**	**0%**	**6.7%**	**7.0%**
PHARMACEUTICAL COMPANIES												
Abbott Laboratories	$ 1,503.4	$ 240.2	14%	13%	16.0%	16.1%	$ 2,941.8	$ 465.2	13%	13%	15.8%	15.7%
American Home Products	1,605.1	270.4	1	13	16.8	15.1	3,418.5	584.8	3	13	17.1	15.6
Baxter International	2,003.0	110.0	8	6	5.5	5.6	3,906.0	−273.0[c]	8	def	def	5.6
Bristol Myers-Squibb	2,483.9	417.3	11	21	16.8	15.4	4,941.6	826.3	10	20	16.7	15.3
Merck	1,899.3	470.2	20	19	24.8	25.0	3,657.8	874.0	16	19	23.9	23.3
Pfizer	1,495.0	151.2	15	11	10.1	10.4	2,977.7	403.1	9	7	13.5	13.7
Schering-Plough	864.0	144.1	7	20	16.7	15.0	1,729.1	294.5	6	20	17.0	15.0
Upjohn	804.7	114.1	11	21	14.2	13.0	1,577.6	228.3	7	15	14.5	13.5
Warner Lambert	1,154.8	134.5	13	20	11.6	11.0	2,254.8	254.8	10	19	11.3	10.4
TOTAL	**$13,813.1**	**$2051.9**	**11%**	**17%**	**14.9%**	**14.1%**	**$ 27,404.9**	**$ 3658.1**	**9%**	**2%**	**13.3%**	**14.3%**

a After-tax earnings from continuing operations, excluding significant extraordinary and nonrecurring items. b After-tax earnings as a percentage of sales. c Includes $566 million pretax restructuring charge. def = deficit.

conditions, we anticipate that 1990 will be Dow's best year in sales and third best in profitability. Assuming a gradually improving global economy and stable margins in the ethylene chain, Dow is positioned for improved earnings in 1991."

However, these projections came out a few weeks ago and things have changed since then; now it is the "gradually improving global economy" that is in question. As of several weeks ago, it looked as if the industry might limp along through the rest of 1990 with a gradually slackening demand leading to lower prices and declining margins. At press time, however, the world situation was volatile enough to call even this mildly pessimistic outlook into question. □